

Listing of Claims:

1. (Currently Amended) An optical fiber for the transmission of optical energy, the optical fiber comprising:

a cladding region including a photonic band gap structure, the optical energy having a wavelength within the photonic band gap of the photonic band gap structure; and

a core region surrounded by the photonic band gap structure,

wherein the photonic band gap fiber guides the optical energy substantially within the core region with a loss of less than about 300 dB/km and wherein the optical energy is guided in a mode having a nonlinear refractive index of less than about 10^{-18} cm²/W.

2. (Original) The optical fiber of claim 1 wherein the optical energy has a wavelength between about 150 nm and about 11 μ m.

3. (Original) The optical fiber of claim 1 wherein the core region has a lower effective refractive index than the average refractive index of the photonic band gap structure.

4. (Original) The optical fiber of claim 1 wherein the core region is composed substantially of a gaseous material.

5. (Original) The optical fiber of claim 1 wherein the optical energy has a wavelength greater than about 1000 nm.

6. (Original) The optical fiber of claim 1 wherein the photonic band gap fiber guides the optical energy substantially within the core region with a loss of less than about 200 dB/km.

7. (Original) The optical fiber of claim 1 wherein the photonic band gap fiber guides the optical energy substantially within the core region with a loss of less than about 50 dB/km.

8. (Original) The optical fiber of claim 1 wherein the photonic band gap fiber guides the optical energy substantially within the core region with a loss of less than about 20 dB/km.

9. (Original) The optical fiber of claim 8 wherein the optical energy has a wavelength between about 1400 nm and about 1500 nm.

10. (Original) The optical fiber of claim 8 wherein the optical energy has a wavelength between about 1680 and 1900 nm.

11. (Cancelled)

12. (Original) The optical fiber of claim 1 wherein the optical signal is guided in a mode having a nonlinear refractive index of less than about $5 \times 10^{-19} \text{ cm}^2/\text{W}$.

13. (Currently Amended) The optical fiber of claim 1 wherein the optical fiber is configured to support capable of supporting a temporal soliton having a peak power of greater than about 1 MW.

14. (Original) The optical fiber of claim 1 having a dispersion of greater than 20 ps/nm/km at a wavelength within the photonic band gap.

15. (Original) The optical fiber of claim 1 wherein the optical fiber is fabricated by a stack-and-draw method.

16. (Original) The optical fiber of claim 1 wherein the optical fiber supports at least two modes guided substantially within the core.

17. (Original) The optical fiber of claim 1 wherein the optical energy propagates in the optical fiber with a wavelength and propagation constant within the band gap of the photonic band gap structure.

18. (Original) The optical fiber of claim 1, wherein the core region has a maximum diameter less than about four times the pitch of the photonic-band gap structure of the cladding region

19. (Original) An optical fiber for the transmission of optical energy, the optical fiber comprising:

a core region; and

a cladding region,

wherein the optical fiber guides the optical energy in a mode having a nonlinear refractive index of less than about 10^{-18} cm²/W.

20. (Original) The optical fiber of claim 19 wherein the optical signal is guided in a mode having a nonlinear refractive index of less than about 5×10^{-19} cm²/W.

21. (Currently Amended) The optical fiber of claim 19 wherein the optical fiber is configured to support capable of supporting a temporal soliton having a peak power of greater than about 1 MW.

22. (Original) The optical fiber of claim 19 wherein the photonic band gap fiber guides the optical energy substantially within the core region with a loss of less than about 300 dB/km.

23. (Original) The optical fiber of claim 19 wherein the photonic band gap fiber guides the optical energy substantially within the core region with a loss of less than about 50 dB/km.

24. (Currently Amended) The optical fiber of claim 19, wherein the cladding region is formed from a photonic band gap structure, the optical energy propagates as a temporal soliton having a wavelength within the photonic band gap of the photonic band gap structure; and wherein the core region is surrounded by the photonic band gap structure.

25. (Currently Amended) An optical fiber comprising

a core region; and

a cladding region,

wherein the optical fiber is configured to support capable of supporting a temporal soliton having a peak power of greater than about 1 MW.

26. (Currently Amended) The optical fiber of claim 25, wherein the optical fiber is configured to support capable of supporting a temporal soliton having a peak power of greater than about 3 MW.

27. (Original) The optical fiber of claim 25, wherein the cladding region is formed from a photonic band gap structure, the soliton having a wavelength within the photonic band gap of the photonic band gap structure; and wherein the core region is surrounded by the photonic band gap structure.